Percutaneous pedicle screws significantly decrease muscle damage and operative time: surgical technique makes a difference!

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Dear Editor,

We read with interest the article by Lehmann et al. [4] on “Comparison of open versus percutaneous pedicle screw insertion in a sheep model”. There is substantial literature on the benefits of minimally invasive spine surgery, including less muscle damage, faster recovery and shorter hospitalization. Recent studies analyzed the amount of muscle damage, via measurements of creatine kinase (CK), that occurs with various types of spine surgery [1, 3]. Open lumbar fusions had a significantly higher amounts of CK (muscle damage) in comparison to other minimally invasive procedures [1, 3]. Based on the aforementioned research, we have collected preliminary data on comparing the amount of muscle damage, utilizing CK, between several different types of lumbar percutaneous screw systems. All percutaneous pedicle screws are delivered over a guidewire, however, the actual method of connection between the rod and screws varies among the different systems. Our preliminary investigation was to determine which percutaneous system caused the least amount of muscle damage. Thus, we compared five different percutaneous pedicle screw systems and found a significant difference in the amount of muscle damage occurring after surgery. The least invasive system, causing the lowest amount of muscle damage, was the Vertiflex Silverbolt, San Clemente, CA, USA. This system has a unique rod delivery mechanism that minimizes the muscle splitting and delivers the rod

subcutaneously through a tower system. Interestingly, Lehmann et al. [4] found longer exposure to radiation with placement of percutaneous pedicle screws. We found this odd and quite the opposite of our clinical experience. We utilize biplanar fluoroscopy for placement of percutaneous screws and upon identifying the pedicle in two planes, can significantly limit the amount of radiation exposure. Lastly, we utilize continuous and direct electromyography (EMG) when placing pedicle screws which allows us to test each pedicle screw to determine if the cortex of the pedicle has been violated, while also eliminating the need for fluoroscopy [2]. We commend Lehmann et al. on their report and agree that percutaneous pedicle screws decrease muscle damage, however, will strongly disagree with their conclusions that percutaneous screws only offer a “moderate” advantage. In experienced hands, percutaneous pedicle screws can decrease operative time, blood loss, muscle damage and radiation exposure, while also significantly shortening hospitalization time and recuperative time.

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